

CAREX CANADA: OCCUPATIONAL AND ENVIRONMENTAL CARCINOGEN SURVEILLANCE

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Background and Aims: CAREX was created by the Finnish Institute for Occupational Health in the 1990s. It raised awareness regarding occupational cancer, is widely quoted, and used to assess the impact of workplace carcinogens. In 2008 we launched CAREX Canada as a population level occupational and environmental surveillance project. The objectives of the project are to identify how many people are exposed, how and where they are exposed, and their level of exposure.

Methods: CAREX Canada adopted the general approach of the original CAREX project for occupational carcinogens, although estimates are produced at a finer level of resolution and groups (based on industry/occupation) are flagged for potential exposures greater than half the occupational limit. Several different approaches were taken for environmental exposures, including spatial modeling and general risk assessment using published measured concentrations. Environmental estimates were converted into benzene equivalent doses or population-level cancer risks in order to compare the relative contribution from various sources or different exposures.

Results: To date we have assessed exposure to 50 occupational and 30 environmental known and suspected carcinogens. The 10 most common occupational are shift work, solar radiation, diesel exhaust, other PAH-related exposures, silica, benzene, wood dust, lead, asbestos and chromium. In the environment, highest estimated lifetime excess cancer risks (>100/million) were due to formaldehyde (indoor air) and diesel particulates (outdoor air). Elevated risks (>10/million<100/million) were also predicted for diesel particulates, acetaldehyde, benzene, 1,3-butadiene and total chromium (indoor air); arsenic, chloroform, hexavalent chromium and bromodichloromethane (drinking water); and arsenic (food). Traffic, residential wood burning, and industrial emitters dominate emissions in watersheds and ecoregions.

Conclusions: CAREX Canada is the first program of its kind in Canada. It is raising awareness of the importance of occupational and environmental cancer, providing essential data for prevention, and is already being used for surveillance, risk assessment, and epidemiology.